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Reconciling Personal Beliefs with a Greater Understanding of Applied Behavioral Analysis: Teaching Children with Autism Spectrum Disorders (Part 1)

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Independent Study with Bonnie Billingsley [1]

[1] Though this paper was written primarily for my own benefit, the intention was to make it available to a wide audience that includes

general and special educators, paraprofessionals, parents, administrators, therapists, and others interested in teaching children with autism spectrum disorders. In order to make this paper as reader-friendly as possible I have attempted to limit the number of references included within the body of the paper. If I only found the information in one source, I noted the source. If many (or all) of my references contained similar information I did not list them individually. However, except where I note my own beliefs or opinions, all of the information provided here is research-based. For more information, please consult the reference list provided.

Introduction

I undertook an independent study of Applied Behavior Analysis (ABA) to gain a more balanced perspective of the science. ABA is promoted as the 'only scientific method' to use for teaching children with autism spectrum disorders (ASD). Through my research I realized that Discrete Trial Training [1] has become synonymous with ABA; however, ABA involves much more than simple discrete trials. The promotion of this one strategy above all others is the crux of my concern with ABA. Applied behavioral analysts use the basic principles of behaviorism and over 190 research-based interventions to have an educational effect on behavior—discrete trial is but one of the tactics at the disposal of the teacher as scientist. In this paper I examine ABA in its broad context, as well as the narrow focus on discrete trial teaching, and their current application to teaching children with ASD. I became reacquainted with the scientific names of good teaching techniques I have used for over 20 years. I have gained a deeper understanding, which has helped me reconcile, to some extent, my personal beliefs with the science of ABA.

[NOTE] ABA programs are generally described as "treatment" or "training." Treatment connotes a medical model, which I find troubling and when I read "training" I think of animals doing tricks. I prefer educating, or instructing others. I interchange these terms throughout the paper.

Basic Behavioral Theory

Behaviorists believe that all behavior is learned. This includes socially desirable behaviors (e.g., reading, politeness) and behaviors that many deem inappropriate (e.g., shouting at another). Behavior is learned as a result of consequences of the behavior (e.g., reading is enjoyable, mom praised good manners, or a person walked away when shouted at). Behavior that is followed by pleasant consequences tends to be repeated, and therefore learned. For example when a child first writes her name her parents might make a big fuss over her and display the writing on the refrigerator. The child is likely to write her name many times after this. Behavior that is followed by unpleasant consequences, tends not to be repeated so is not learned. Imagine the same child wrote her name, with a magic marker, on her bedroom wall. The consequence for this behavior was that mom was angry, and the child had to scrub the walls. The child is not likely to repeat writing on the wall.

Parents and teachers regularly use behavioral principles, though they might not be aware of it. Anyone who has told a child he must finish all of his vegetables before he can have dessert is banking on the behavioral principle of positive reinforcement. A behavior is being positively reinforced if it is followed by a consequence that increases the rate of occurrence of the behavior. Negative reinforcement occurs when a behavior increases when something is removed (usually something negative) after the desired behavior is evidenced. For example, a student gives a teacher a picture card to request a break from a noisy math activity, and the teacher allows her to go for a walk (the child "asked

nicely", and she got out of the environment). A teacher who ignores answers from a student who speaks out in class without raising his hand is attempting to extinguish the behavior. Extinction occurs when behaviors that were previously reinforced are no longer reinforced. Whether or not we are consciously aware of them, behavioral principles are at work all the time.

Applied Behavioral Analysis

Applied Behavior Analysis is "the study of socially significant behavior in natural or naturalistic conditions" (Greer, 2002, p. 283). Applied behavioral analysts use the basic principles of behaviorism and research-based interventions to have an educational effect on behavior. According to Greer there are approximately 190 tactics at the disposal of trained applied behavioral analysts. The purpose of this paper is not to discuss each of the 190 tactics, but to note that ABA tactics and principles are utilized to analyze and intervene in learning and teaching problems. For example children who do not yet have the skills to tell others what they need, cannot read fluently, or do not follow teacher instructions may have learning or teaching problems that can be addressed through ABA. In fact, applied behavior analysts would say that their techniques can address virtually any teaching or learning need. Please note that ABA principles are used to analyze teaching as well as learning problems. Applied behavior analysts look at their own behaviors as well as the student's. E.g., rather than assuming a child is unmotivated to learn, a teacher using ABA would determine if she is using an appropriate reinforcement, or if she has taught the necessary precursor skills. An applied behavior analyst is interested in remediating students' educational and social behaviors and teaching skills to mastery through appropriate tactics.

The pedagogy of ABA "is a science of individualized instruction" (Greer, p. 10). The law requires that students with disabilities be provided with individualized education to assist them in achieving desired outcomes. Greer argues that all children should receive individualized instruction whether they are typically developing, have a disability, do not speak English, or anyone else we might describe. He further describes teachers who use ABA practices as continuously measuring teaching and student responses and using readily available graphs of student performance data to guide teaching decisions. Applied behavior analysts implement research-based curricula, teaching educationally and socially significant repertoires, and react to the student's responses to adjust teaching as needed. Finally, Greer espouses that ABA teachers are "scientists of pedagogy" who foster a positive classroom environment and avoid coercive procedures such as reprimands.

Core ABA teaching practices are encapsulated under three repertoires. Repertoires are groups of responses, each group being comprised of behaviors, discriminated stimuli (Sds), consequences, and setting events. The repertoires, as outlined by Greer, describe teaching practices: contingency shaped behaviors; verbal behavior; using the language of behaviorism; and analyzing and solving instructional problems through verbally mediated repertoires.

Contingency-shaped Repertoire

The contingency-shaped behaviors comprise the first repertoire. "Contingency-shaped behaviors are those behaviors that are reinforced or punished directly by contingencies in the environment" (Greer, p. 43). The antecedents and consequences of a person's responses directly teach these contingency-shaped repertoires. Learning to play a game of Tic Tac Toe is contingency shaped—a child repeatedly plays, wins or

loses, and learns the strategies required. The child learns to automatically play the best Tic Tac Toe strategy. By the same token, a teacher who uses ABA practices to a level of automaticity, has learned through contingency-shaping; her use of the practices (or not) led to success or failure in students, thereby shaping her behavior to further utilize and learn the practices. Contingency-shaped behaviors that must be mastered by a teacher scientist include when and how to ignore students' behavior; how to reinforce students' responses positively, contingently, and frequently; teaching units of learning to maintain instructional engagement; supervising other staff including paraprofessionals and peer tutors; providing individualized instruction; and reliably recording and displaying student responses

Verbal Repertoire

Teachers who wish to become applied behavioral analysts must learn about effective behavioral strategies and acquire the vocabulary to describe the practices. Some teachers learn the tactics of ABA, but may not know the vocabulary; other teachers may learn the vocabulary without demonstrating the effective practices. To become a behavioral scientist the teacher must use the vocabulary of the science; verbally and in writing provide the rationale for using particular tactics; be continuous learners about ABA; and discuss behaviors, environments, trends and practices with other applied behavioral analysts. Working with other skilled practitioners of ABA is essential to assist teachers in learning the verbal repertoires and connecting the language to implementing the contingency –shaped repertoires.

Verbally Mediated Repertoire

Even the best practitioner of ABA using correct contingency-shaped repertoires will encounter teaching problems. The well-prepared scientist examines these instructional issues via verbally mediated repertoires. To verbally mediate a problem the teacher as scientist uses the correct vocabulary (verbal behavior) to analyze the data paths (graphed data) to determine a learning trend (e.g., data paths are plateaued). The trend will suggest several tactics (contingency-shaped repertoires) to utilize in solving the teaching problem. The scientific vocabulary suggests solutions to the teacher, without assigning blame to an inadequacy within the student.

The focus of ABA is to change behavior. B.F. Skinner, the father of behaviorism, proposed that the explanation for a behavior is less important than determining what factors exist that will increase, decrease, or maintain a specific behavior. For example, a student may have mastered reading words in isolation, but has not achieved reading fluency. Suggesting the child has a reading disability does not solve the problem. Rather, an analysis of the data suggests that the student has mastered the prerequisite skill, but when presented with the more complex task she has a slow rate of correct responses and a high rate of incorrect responses. The scientist might determine that the component skill was mastered, but does not meet the normative number in time criterion. This is a problem in instructional history. One tactic that the teacher might employ to solve this instructional problem is to make reinforcement contingent upon a number of correct responses per minute rate requirement. The teaching strategy leads to behavioral change, whereas labeling (explaining) the behavior as a disability does not immediately generate change.

Components of an Individualized ABA Program

1. The first step in designing an ABA program for a child is to

describe the present and desired behaviors in observable, measurable terms. Target behaviors are those behaviors that the teacher wants to increase or decrease. For example, a target behavior might be completing tasks, writing her name, spitting.

2. Next, an effective reinforcer is identified to use when teaching the child a particular skill. Reinforcers might be primary—anything that satisfies a primal need—usually food or drink, or secondary—praise, stickers, play time, money, or any other activity or item the student indicates.

3. The third step is to determine which tactic will be used to modify the target behavior. For example the applied behavior analyst might choose to reinforce the desired behavior every time it occurs, shape the behavior by reinforcing closer and closer approximations of the behavior, or use backward chaining to teach the skill sequence until the behavior is mastered.

4. Data is collected on the behavior both before and during instruction. Gathering baseline data prior to instruction allows the teacher as scientist to determine if goals are met through instruction. Behavior analysts must be objective in data collection to ensure skill acquisition. In the best of circumstances one person provides the instruction while at least 2 others, with observation skills, record incidences of the target behavior.

5. Instruction is scrutinized for effectiveness and modified as necessary. If a desired behavior increases, or an undesired behavior decreases in comparison with baseline data no modification is necessary. However, if little change is noted, or desired behaviors decrease and unwanted behaviors increase then the program must be modified. The applied behavior analyst would use her skills in verbally mediating the problem to design a more appropriate treatment program.

6. Steps must be taken to actively promote generalization; this should be concurrent with instruction. Skills must be taught and demonstrated in multiple settings, with many different people, and under different circumstances to be considered truly within the student's repertoire. If a child only demonstrates skills in one environment, under certain conditions, the teaching program has not been effective and generalization has not been achieved. Again the well-trained applied behavior analyst would verbally mediate the problem and redesign the instructional program.

7. Finally, the treatment program for a particular behavior is phased out once the desired behavior is acquired. At times the behavior becomes its own reinforcement; for example, reading is enjoyable, and is maintained through continued practice. At other times the skill is a building block to other behaviors and is practiced as part of a larger scheme (e.g., sitting in a chair to complete a work task is practiced while increasingly difficult tasks are taught). There are also skills that might require intermittent reinforcement to maintain (e.g., practicing multiplication)

Programs that Utilize Behavioral Interventions

There are many programs that are implemented with children with ASD that utilize some of, but perhaps not all of, the concepts of ABA. Among these are the use of incidental teaching, Pivotal Response Training, Division TEACCH (Treatment and Education of Autistic and related

Communication handicapped CHildren), the Learning Experiences, and Alternative Program (LEAP), the DIRTM Model (Developmental Individualized Relationship), and Discrete Trial Training. All the models, with the exception of discrete trial training, incorporate other theories of child development and instruction. Regardless of their differences, all have common components including frequent (many hours each day) interactions and learning opportunities, an appreciation of the uniqueness of the individual with an autism spectrum disorder, carefully planned and predictable instruction, and ongoing support and tuition for adult supporters.

This article is only an overview about possible reading approaches. All children are different and what works for one child may or may not work for someone else. The important goal is to begin teaching every child to read, regardless of the barriers. If you hit a barrier, be creative and find another way to get to the goal.

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Leslie Daniel, Severe Disabilities Lead Coordinator for the Training and Technical Assistance Center at Virginia Tech, has worked with people with disabilities for over 20 years. For the last 9 years she has focused on learning more about autism and strategies to help students with autism spectrum disorders in their schools and communities. Currently Leslie has taken a leave of absence to work on her doctorial program at Virginia Tech.

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